NOAA Fisheries

Coral Reef Conservation Prograı

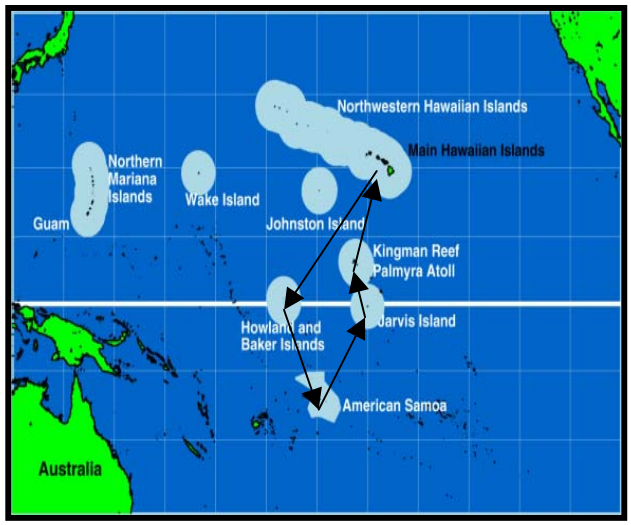
2002 Pacific Highlight

NOAA Fisheries

American Samoa, Line and Phoenix Islands Coral Reef Assessment Cruise

In January 2002, NOAA Fisheries Honolulu Laboratory's Coral Reef Ecosystem Investigation led a multidisciplinary expedition to American Samoa and the U.S. Line and Phoenix Islands, which included benthic habitat and ecological assessment surveys and oceanographic monitoring work. This research expedition aboard the NOAA ship *Townsend Cromwell* was her first to American Samoa in 17 years. The data provide a better picture of the region's ocean structure and dynamics, which is essential to understanding the functioning of coral reef and fishery resources. NOAA Fisheries (NMFS), working with scientists from the University of Hawaii, the Government of American Samoa, U.S. Fish and Wildlife, and the Bishop Museum conducted a series of habitat surveys and oceanographic measurements and transferred assessment and monitoring approaches and techniques to researchers and managers of American Samoa.

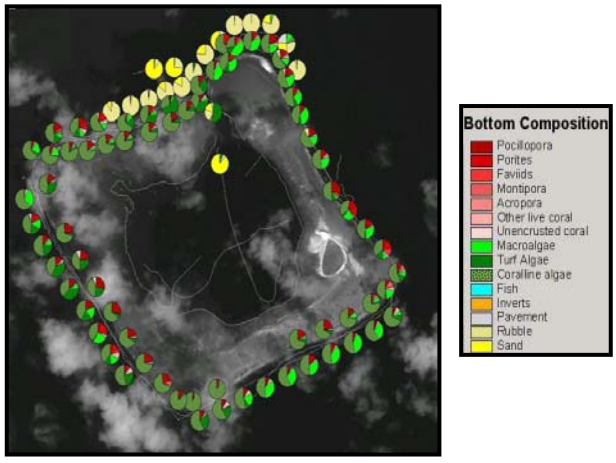
NOAA ship *Townsend Cromwell*



Extensive surveys conducted during the cruise included 102 towed diver habitat and fish surveys, 997 km of acoustic seabed mapping and classification surveys, 11 camera tows, 90 fish and benthic rapid ecological assessments, and establishment of 8 permanent oceanographic monitoring stations.

Tow board survey

Benthic Habitat Summary of Video Analysis for Rose Atoll, American Samoa



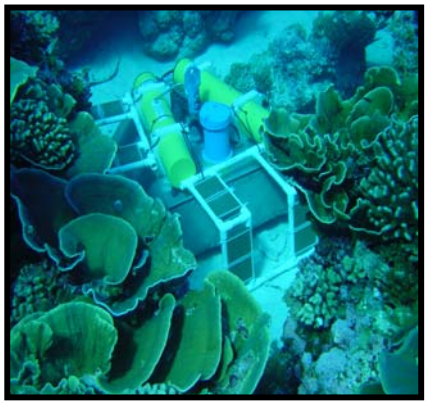
This is a spatial display of benthic habitat composition data from tow board surveys

The methods being developed by NMFS allow researchers to determine changes in biomass, abundance, and species diversity at a variety of temporal and spatial scales. Some preliminary findings from the ecological assessment surveys suggest that in American Samoa large fish densities were low relative to those of the Northwestern Hawaiian Islands. Grouper abundances were about twice as high on the Samoan outer islands reefs, where human population is low, than near populated islands where over fishing is a problem. Preliminary results from American Samoa indicate 52 new records of algal species from 4 sites. Linking oceanographic and biological survey results show

that the U.S. Line and Phoenix islands are at the junction of two bio-geographical areas, one centered in French Polynesia and a larger one centered in Micronesia, and are unique among U.S. coral reef ecosystems. This is exemplified by the co-occurrence of a western central Pacific species of surgeonfish and a French Polynesian species of surgeonfish. Other results from these islands yielded 164 species of fish not previously reported.

Palmyra Atoll

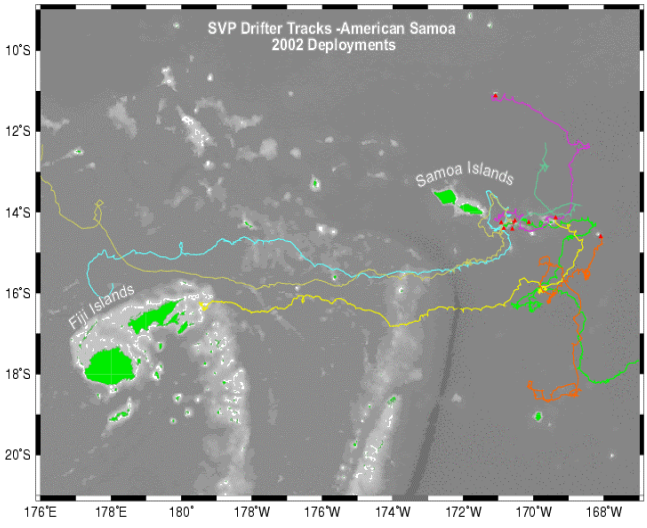
This cruise also provided the platform to deploy and use a variety of oceanographic instruments. First, an array of fifteen moored buoys was deployed to enhance scientific understanding of the oceanographic processes that maintain and support coral reef ecosystem. Two types of the moored buoys, the Coral Reef Early Warning System and sea surface temperature buoys, provide satellite-telemetered data on ocean sea surface temperature, barometric pressure, and wind speed and direction. This information is plotted and posted daily on the NMFS web site (http://crei.nmfs.hawaii.edu/) to allow fisheries managers and scientists immediate access to NMFS data products. Second, to understand how currents disperse larvae, eight Surface Velocity Program drifter buoys were deployed in American Samoa. These buoys also telemeter data via satellite, which are plotted to track the buoys' movements and improve scientific understanding of ocean currents (see figure below). The third type of oceanographic studies utilized shipboard observations to measure conductivity, temperature, and depth with chlorophyll and dissolved oxygen around the islands or atolls, while mapping bottom habitat.



ADCP mooring buoy with settlement plates

Through these intensive ecological surveys and deployment of oceanographic moorings, NMFS has opened new avenues for the managers of American Samoa's coral resources to access their remote islands and to further enhance understanding and management of these areas. NMFS future plans include conducting a similar cruise to Guam and the Commonwealth of the Northern Mariana Islands in FY2003.

SVP drifter buoys movements after deployment in American Samoa



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This is an element of the NOAA Coral Reef Conservation Program.